

# PATENT COOPERATION TREATY

From the:  
INTERNATIONAL SEARCHING AUTHORITY

To:

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## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) **14 JUL 2004**

**FOR FURTHER ACTION**  
See paragraph 2 below

Applicant's or agent's file reference

International application No.

**PCT/AU2004/000438**

International filing date (day/month/year)

**5 April 2004**

Priority date (day/month/year)

**4 April 2003**

International Patent Classification (IPC) or both national classification and IPC

**Int. Cl. <sup>7</sup> G01N 33/18, 31/10, 27/413, 27/30**

Applicant

**GRIFFITH UNIVERSITY et al**

1. This opinion contains indications relating to the following items:

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application   |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application  |

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the IPEA/AU

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No. .

**PCT/AU2004/000438**

**Box No. I      Basis of the opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

**PCT/AU2004/000438**

**Box No. V**      **Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	YES
	Claims 1-17	NO
Inventive step (IS)	Claims	YES
	Claims 1-17	NO
Industrial applicability (IA)	Claims 1-17	YES
	Claims	NO

**2. Citations and explanations:**

JIANG et al., "Photoelectrochemical behaviour of methanol oxidation at nanoporous TiO<sub>2</sub> film electrodes", Journal of Photochemistry and Photobiology A: Chemistry, Elsevier Science B.V., Volume 144, 2001 pages 197-204.—The whole document—especially page 198, left column and page 203, right column.  
 Patent Abstracts of Japan, JP 11-132997 A (DAM SUIGENCHI KANKYO SEIBI CENTER et al.) 21 May 1999.—Abstract; drawing.  
 DE 4406612 A1 (MÜLLER et al.) 7 September 1995.—Abstract; claims.  
 Patent Abstracts of Japan, JP 06-148172 A (JAPAN STORAGE BATTERY CO LTD) 27 May 1994.—Abstract; drawing.  
 EP 282441 A2 (PILZ) 14 September 1988.—Claims; figures 1-2.  
 CN 1412540 A (UNIV HUADONG) 23 April 2003 (online) (retrieved on 1 July 2004) Retrieved from the Internet <URL: <http://ep.espacenet.com>>.—esp@cenet - Document Bibliography and Abstract.  
 EP 834739 A2 (LAR ANALYTIK UND UMWELMESSTECHNIK GMBH) 8 April 1998.—Claims; figures 1-3.

**NOVELTY (N), INVENTIVE STEP (IS) CLAIMS 1-17**

JIANG discloses the two characterising features of the invention—immobilizing the TiO<sub>2</sub> particles onto a glass substrate, and applying an electrical potential bias to the TiO<sub>2</sub> film—in the specific case of methanol oxidation. While the citation does not specifically mention chemical oxygen demand, that is essentially a broader term for the disclosure in JIANG. JIANG also describes the advantages of the above two features and the results obtained for methanol oxidation. The claimed invention does not appear to be novel or to involve an inventive step in light of JIANG.

DAM SUIGENCHI KANKYO SEIBI CENTER discloses an electrolysis-type COD sensor. The citation discloses application of constant potential bias, subjecting an organic matter in the sample water to electrolysis oxidation, measurement of electricity, and obtaining the COD of sample water. The citation does not disclose a photocatalyst like TiO<sub>2</sub>. Similarly PILZ and LAR ANALYTIK UND UMWELMESSTECHNIK GMBH disclose electrochemical processes for the measurement of COD but these do not involve photoelectrochemistry.